



**September**

**1997**

---

## ***DESIGN VISUALIZATION PROVIDING A GLIMPSE INTO THE FUTURE***

by Janice Derry, Design Engineer

### ***INTRODUCTION***

There are some projects that glide through the environmental and design process, while other projects are challenged at every turn. It seems projects that glide through these processes are becoming the minority. Therefore, more understanding of the impacts of highway construction is required, not only by the public, but by other government agencies. This is why design visualization is becoming an important tool of the environmental and design process. An example of a challenged project that used design visualization is a Western Federal Lands Highway Division (WFLHD) project referred to as "Blaine Road".

### ***PROJECT BACKGROUND***

Blaine Road is a narrow, low-volume, two-lane collector road located southeast of Tillamook, Oregon on the Siuslaw National Forest, Bureau of Land Management, and private lands. It is sandwiched between steep hillside slopes that have a tendency to slide and a state scenic river. Blaine Road is under the watchful environmental eye of a few local residents in a political arena where environmental concerns are very important. The original design of realignment and flattened cut slopes has changed several times due to input from agencies that have concerns with the view from the river, and impacts to fish. Currently, the design follows the existing alignment and has several slope and wall treatments. Many of the slope and wall treatments are on the riparian side in view of the river. At the last agency meeting on April 3, 1997, eight wall treatments areas showing the most impacts were displayed using design visualization and a typical section. The following two sites best exemplify the value and benefit of utilizing design visualization.



***Federal Highway Administration***



## ***SITE A***

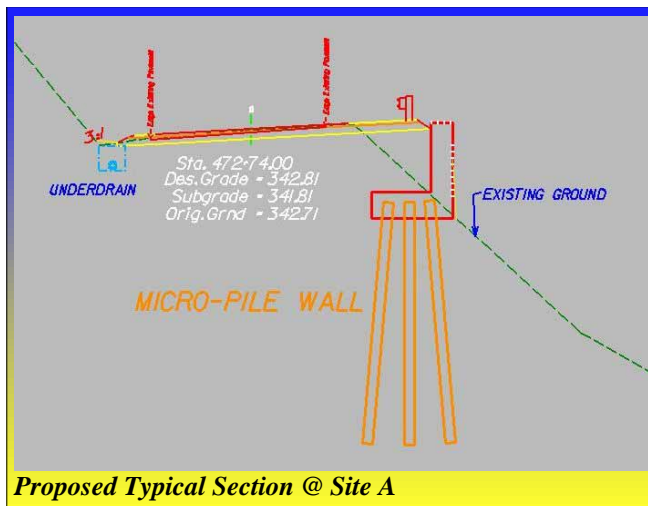
The existing area has a weakened base substructure, pavement deterioration, and a narrow 3-meter (10-foot) top pavement width. In order to improve the pavement and achieve 0.6-meter (2-foot) shoulders for safety, the roadway needs to be widened. The hillside is very steep. Normal cut slopes would create large excavation quantities, may cause future slide movement, and degrade the visual quality of the scenic river. The ditch section was shortened and underdrain was proposed to avoid cutting into the hillside which may activate the slide. In order to minimize circular slide movement, micropiles are proposed. The micropiles would act like nails to hold the bottom of the slide. The cap



***Site A - Existing***

would need to be modified to provide the additional widening required. The exposed cap of the micropile wall will have a artificial rock facade to blend with the natural surroundings. Guardrail is necessary for safety since a vertical slope is added close to a river.

The photo visualization allowed governments agencies present at the meeting to better understand and visualize the impacts of the proposed design concepts. It illustrated that the widening to the right side will not take many of the existing trees while maintaining the visual quality of the river.



***Proposed Typical Section @ Site A***



***Site A - Proposed***

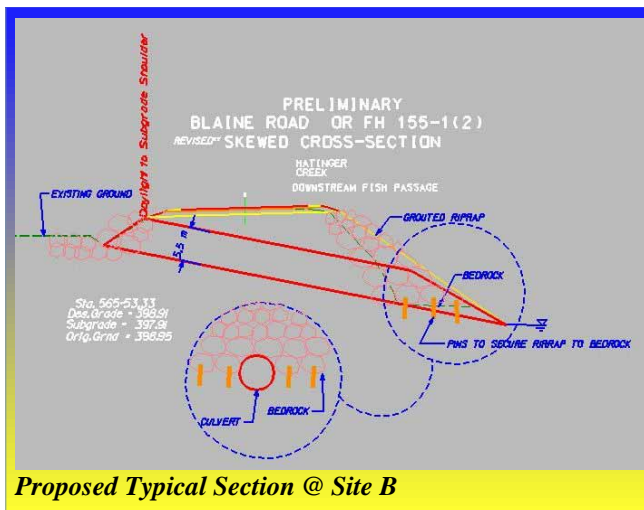
## ***SITE B***

This area is a site for a proposed downstream fish passage by state and federal entities. A small amount of widening is necessary to obtain a 7.3-meter (24-foot) top pavement width. The existing vegetation shown in the before photo illustrates that the impacts to the riparian area are less in this area than other areas along the river. It also illustrates a small bench to place the riprap. It is anticipated that riprap can be placed on the existing bedrock bench to minimize impacts to the river. River disturbance will be localized for culvert outlet installation.



**Site B - Existing**

The photo visualization illustrated that the riprap can be added and will not encroach into the river. Showing the riprap on the bench and not into the river is an important concept for the agencies to understand. Agencies concerned with the visual aspects of the project have now accepted this concept. Agencies concerned with impacts to the fish have not determined what impacts the riprap will have on the fish and what mitigation is necessary to compensate for the impacts. The difference between the two photos demonstrates the poor existing conditions of the riparian area and the visual impacts the proposed design will have on the river.



**Proposed Typical Section @ Site B**



**Site B - Proposed**

## PROCESS

Photos were taken showing where the toe of the slope is predicted. A digital and a 35mm camera were used to take the photos. Color prints from the 35mm camera were scanned into the computer. Blowing up the digital camera prints did not work well. A low resolution setting was used when the photos were taken. Maybe a higher resolution setting would have produced better results. Until this process is perfected, a 35mm should be used as a backup system. Using the photos and typicals, a view of the area was produced showing the affects of the wall treatments. Some flaws were retained in the design visualization to prevent it from looking like an actual photo. The conceptual appearance of the impacts should be close to the proposed design. It took approximately a week to produce eight "Proposed Design" photos. The package to the agency meeting included an "Existing Condition" and "Proposed Design" photo next to the typical section.

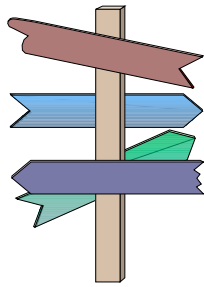
## ***RESULTS***

The response to the design visualizations was complimentary. The photos helped to illustrate the minimal impacts of the proposed design concepts. The agencies concerned with the view from the river were more favorable toward the project. After the meeting, some agencies were curious how the “Proposed Design” photos were created. The photos were then used to demonstrate the possibilities of design visualization at WFLHD’s Open House. It is also anticipated that some of the photos will be used for the Supplemental Environmental Assessment.

## ***CONCLUSION***

The design visualization goal for Blaine Road is to provide a glimpse of the future to show the impacts the design will have. Blaine Road is still in the environmental stage. These concepts will be modified further into the design process. The design visualization photos did aid in gaining the support of governmental agencies who were concerned with the visual aesthetics of the design. More work is needed to gain the support of the agencies who are concerned with the impacts on proposed threatened and endangered fish. Design visualization helps everyone involved with a project to better understand what options are available.

## ROAD SIGNS



People who are knowledgeable about poetry sometimes discuss it in that knowing, rather hateful way in which oenophiles talk about wine: robust, delicate, muscular. This has nothing to do with how most of us experience it, the heart coming around the corner and unexpectedly running into the mind. Of all the words that have stuck to the ribs of my soul, poetry has been the most filling.

- Anna Quindlen

---

We wish to thank all the individuals who have contributed articles for previous newsletters. If you are aware of a new technology, (or a fresh spin on an old one) please jot down your ideas and submit them via e-mail to me at the address below. Or, if you have an aversion to writing, just donate 15 minutes of your time for an interview (either by phone or in person), and I'll format the information for you. You can then review the article for accuracy (via e-mail or hard copy) and upon publication, you'll become famous in a matter of days. Remember, although we cater to road-related technology, ANY new technology information is welcome.

Please send all submissions to Kristi Swisher - (360.696.7572). Be sure your name, title, and phone number are the way you want them to appear in the article. Articles are subject to editor/ layout approval and may be condensed if space is limited.

**For your convenience, all issues of the WFLHD Technology Development News are also available for viewing and downloading from the WFLHD Technology Development web page. We invite you to broaden your understanding of the WFLHD Technology Development Program Visit us at <http://www.wfl.fha.dot.gov/td/>.**

Federal Highway Administration  
610 East Fifth Street  
Vancouver WA 98661